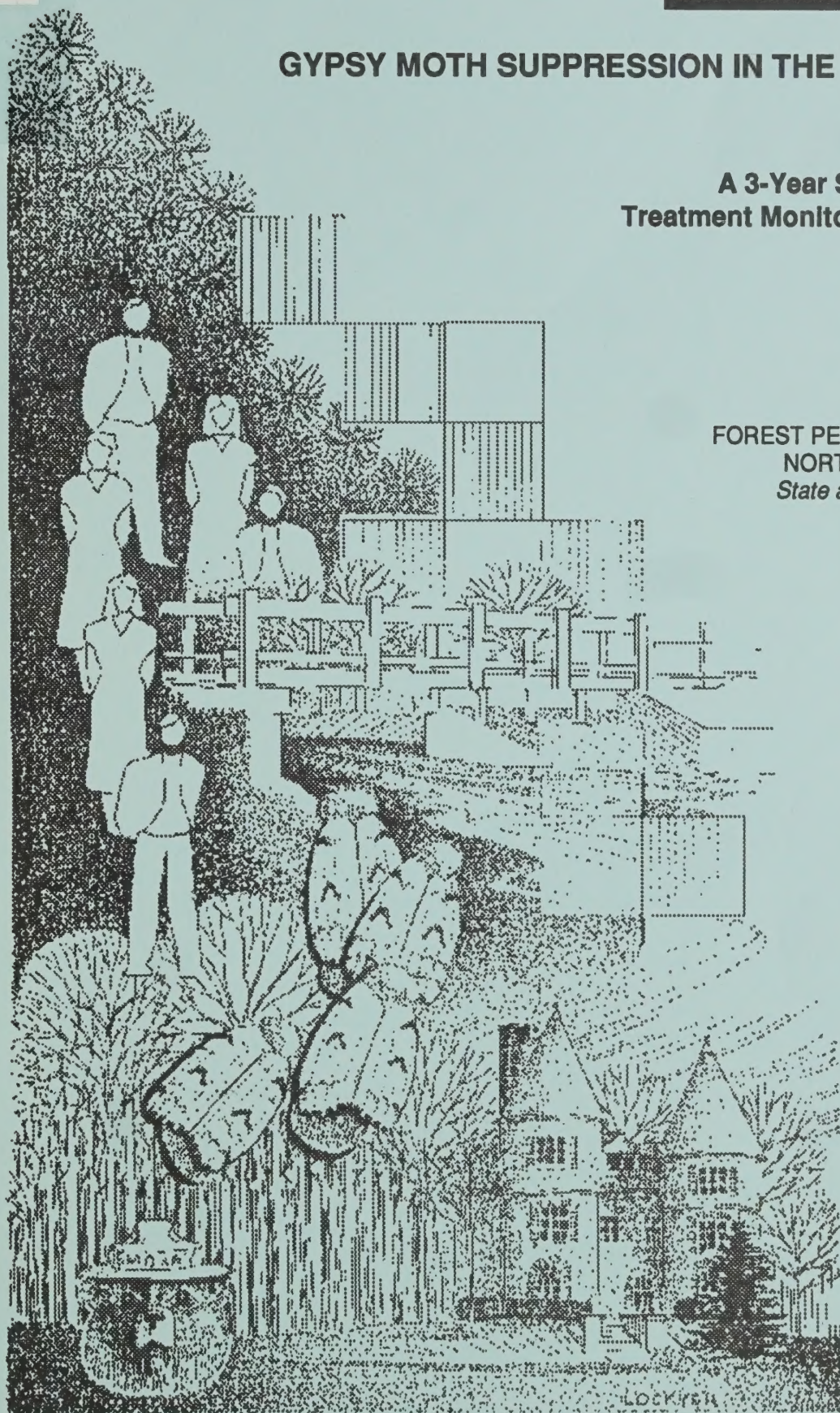# GYPSY MOTH SUPPRESSION IN THE NORTHEAST

A 3-Year Summary of the Treatment Monitoring Data Base

FOREST PEST MANAGEMENT
NORTHEASTERN AREA
State and Private Forestry

Daniel B. Twardus
Helen A. Machesky
Morgantown, WV
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United States
Department of
Agriculture

Forest Service

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NORTHEASTERN AREA
State and Private Forestry

GYPSY MOTH SUPPRESSION IN THE NORTHEAST

INTRODUCTION

The Treatment Monitoring Data Base (TMDB) is an evaluation tool specifically developed for USDA Forest Service Gypsy Moth suppression projects. At present, it is the only existing data base and summary of the effectiveness of gypsy moth suppression efforts. Even though the USDA Forest Service has participated in gypsy moth suppression for at least 15 years, no record of the effectiveness of this program exists. Prior to TMDB, the Forest Service had no method of quantifying suppression results other than through estimates of total acres sprayed. This is analogous to evaluating results of a battle on the basis of bullets fired.

TMDB is a data base management system providing record-keeping and data summary functions. Evaluation aspects lie in standardizing data collection, focusing attention upon important data to be collected, and using data to analyze project operations and effectiveness.
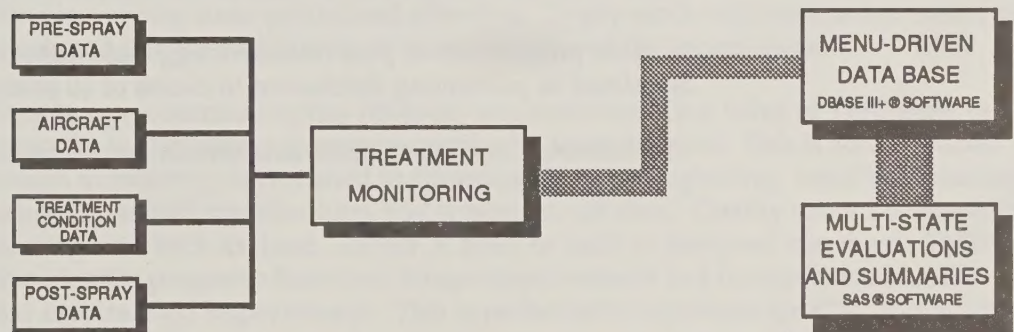
Data is provided by personnel associated with each suppression project. In some projects, data is collected from all spray blocks while in others only a portion of the total number of sprayed blocks are represented in TMDB. To be included in TMDB, a spray block must have pre-treatment, treatment, and post-treatment data collected, i.e. a spray block is followed from beginning to end.

This report focuses upon two aspects of suppression evaluation—estimates of gypsy moth **population reduction** and estimates of overall **project success**. It summarizes 3 years of the TMDB, 1986-1988, except for West Virginia which includes 1987-1989.

POPULATION REDUCTION

Population reduction is estimated as the percent change in egg mass density from pre-treatment to post-treatment. Two insecticides are evaluated here, Dipel 8L and Dimilin 25W. At present, these are the predominant insecticides in TMDB. The following tabulation summarizes population reduction:

Project	Dimilin	Dipel
	Average Percent Reduction In Gypsy Moth Egg Mass Density After Treatment	
Allegheny National Forest	-	82
Delaware	76	73
Maryland	83	46
West Virginia	92	-
Virginia	82	-
Total Average	84	67

PROJECT SUCCESS

TMDB introduces the concept of project success rate. In this report, a successfully treated block is defined as having a reduction in egg mass density to below 500 egg masses per acre and that this reduction represents at least an 80 percent reduction from pre-treatment estimates. Success rate uses population reduction in the context of meeting a predefined objective and is a measure of the frequency of successful treatment. That is, what percent of total blocks treated met the criterion for success.

In those projects where post-treatment egg mass densities were not estimated, success is defined as preventing defoliation in excess of 30 percent.

The following tabulation summarizes both success rates for individual projects over a 3-year period:

Project	Percent of Blocks Successfully Treated Based Upon Egg Mass Reduction		Percent of Blocks Successfully Treated Based Upon Defoliation Prevention	
	Dimilin	Dipel	Dimilin	Dipel
Allegheny National Forest	-	56	-	66
Delaware	69	45	-	-
Maryland	76	41	-	-
West Virginia	79	-	-	-
Virginia	63	-	-	-
Pennsylvania	-	-	95	94
New Jersey Forestry	-	-	100	67
New Jersey Agriculture	-	-	-	68
Average	72	47	98	74

These results reflect the percent of the total number of blocks treated with each insecticide that met the criteria for success. For defoliation prevention, only a few projects are represented. This is because most projects use egg mass reduction as their project objective.

Note that average success rates are higher when defoliation prevention is the objective rather than when egg mass reduction is the objective.

**SUMMARY
STATISTICS**

In summary, this report indicates:

- average population reduction caused by Dimilin is 84 percent, resulting in a successfully treated block 72 percent of the time.

- average population reduction caused by Dipel is 67 percent, resulting in a successfully treated block 47 percent of the time.

Where defoliation prevention is the criteria for success:

- 74 percent of Dipel blocks were successfully treated
- 98 percent of Dimilin blocks were successfully treated

These results indicate that since most projects list egg mass reduction as an objective, some program improvement is warranted. In fact, for B.t. treated blocks, it is essential.

This report documents the first time that success rates have been determined. The utility of these success rates lies in quantifying the effectiveness of suppression efforts in meeting some predefined objective. Gypsy moth suppression is a means to an end, and it is the end that must be measured--not the means alone.

Focusing upon success implies program improvement. One value of TMDB lies in having the information necessary to guide this improvement. This is accomplished through monitoring data related to operational aspects including: conditions during treatment, aircraft specifications, and treatment site data. Quality cannot be inspected into programs such as these. Rather, it must be built or designed into them. TMDB helps identify programs that need design improvement and further helps identify what aspects need improvement. This is particularly important for FPM administrative and technical assistance roles. Evaluating data associated with treatment success and failures can help focus assistance, research, and training. This is equally important within a State cooperative project, where TMDB results can be used to compare regional or county operations in order to focus support, assistance, or training.

**MANAGEMENT
OPPORTUNITIES**

1. The TMDB can be endorsed as an integral part of all gypsy moth suppression in which Forest Service funds or expertise are used. TMDB will help standardize the type and level of information needed to conduct a gypsy moth project. TMDB focuses upon data that is relevant to the efficient and effective aerial application of insecticides. Its use, therefore, will contribute to project improvement.

2. TMDB summaries can be used to review individual project operations as well as operations and results overall. Within each cooperating suppression project, TMDB can be used to summarize results, analyze patterns related to success and failure, and make recommendations for assistance or improvement in operations. Each cooperative suppression or eradication project should include as part of the cost-sharing expenses a yearly review of TMDB. Similarly, FPM should conduct a yearly summary of TMDB in order to report upon overall program accomplishments.

3. TMDB can be used to set targets for accomplishment. The TMDB provides a ready means to establish targets for project success within and among projects. This replaces number of acres sprayed, with number of acres sprayed SUCCESSFULLY as the accomplishment target for projects. A baseline success rate can be used to compare project effectiveness. As an example, a county-level target for success might be set at 60 percent of blocks successfully treated, and a State target level might be set at 80 percent of blocks successfully treated. Counties or States falling below targets can be singled out for specialized assistance. This can dramatically alter the historical "technical assistance" role of FPM by focusing that assistance on identifiable problem areas. These targets and their associated data base provide "handles" for FPM to use in fulfilling its administrative and technical assistance functions.

4. Training related to the TMDB can be used to improve the basic quality of suppression. One of the ironic criticisms of the TMDB has been that people supplying the data may be unskilled. Yet, it is these same people who are providing ground level support for cooperative suppression. Since the TMDB focuses upon data that is relevent to the effective and efficient aerial application of insecticides, it can help to point to areas of training and people needing it. The Forest Service has then, an opportunity to work with state agencies to devise state-specific training directed at field personnel who are on-site during suppression. The TMDB provides a focus or "greater objective" for that training.

ACTION ITEMS

1. Develop data standards for Treatment Monitoring. TMDB requires data collection and entry. Data collection must be standardized in the sense that some minimum number of treatment blocks from each project must be included and data collection practices must be uniform.

> Who - Field Representatives (St. Paul, Durham,
>   Morgantown, Asheville)
> When - by October 1, 1990

2. Require, that all cooperative gypsy moth Forest Service Suppression projects adhere to TMDB standards in order to qualify for cost-share funds. Require that all Federal gypsy moth suppression projects adhere to TMDB standards.

> Who - Director, FPM, WO
> When - by October 1, 1990

3. Require that each field office conduct a yearly review of TMDB results for each cooperating gypsy moth suppression project. This review should focus upon 1) success rates, 2) patterns related to treatment success or failure, 3) problems associated with data collection, 4) recommendations for subsequent operations, and 5) new targets for effectiveness.
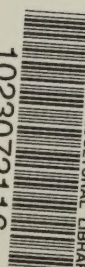
> Who - FPM Staff Directors, NA, R-8
> When - by October 1, 1990

4. Request a yearly summary of Treatment Monitoring Results that describes program effectiveness and recommendations for future improvements. This review should be a cooperative one between FPM and FIDR. A jointly conducted review provides an opportunity for interaction and involvement of FIDR.

Who - Director, FPM, WO
When - yearly, by November 1 of each year for preceding year